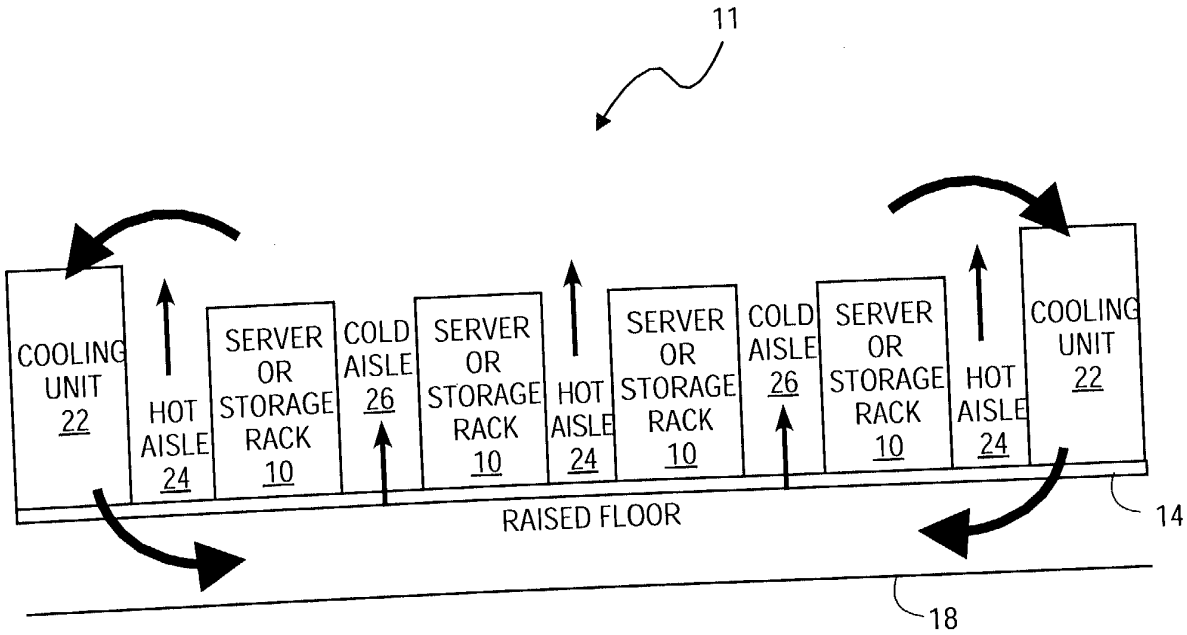

FIG. 1A

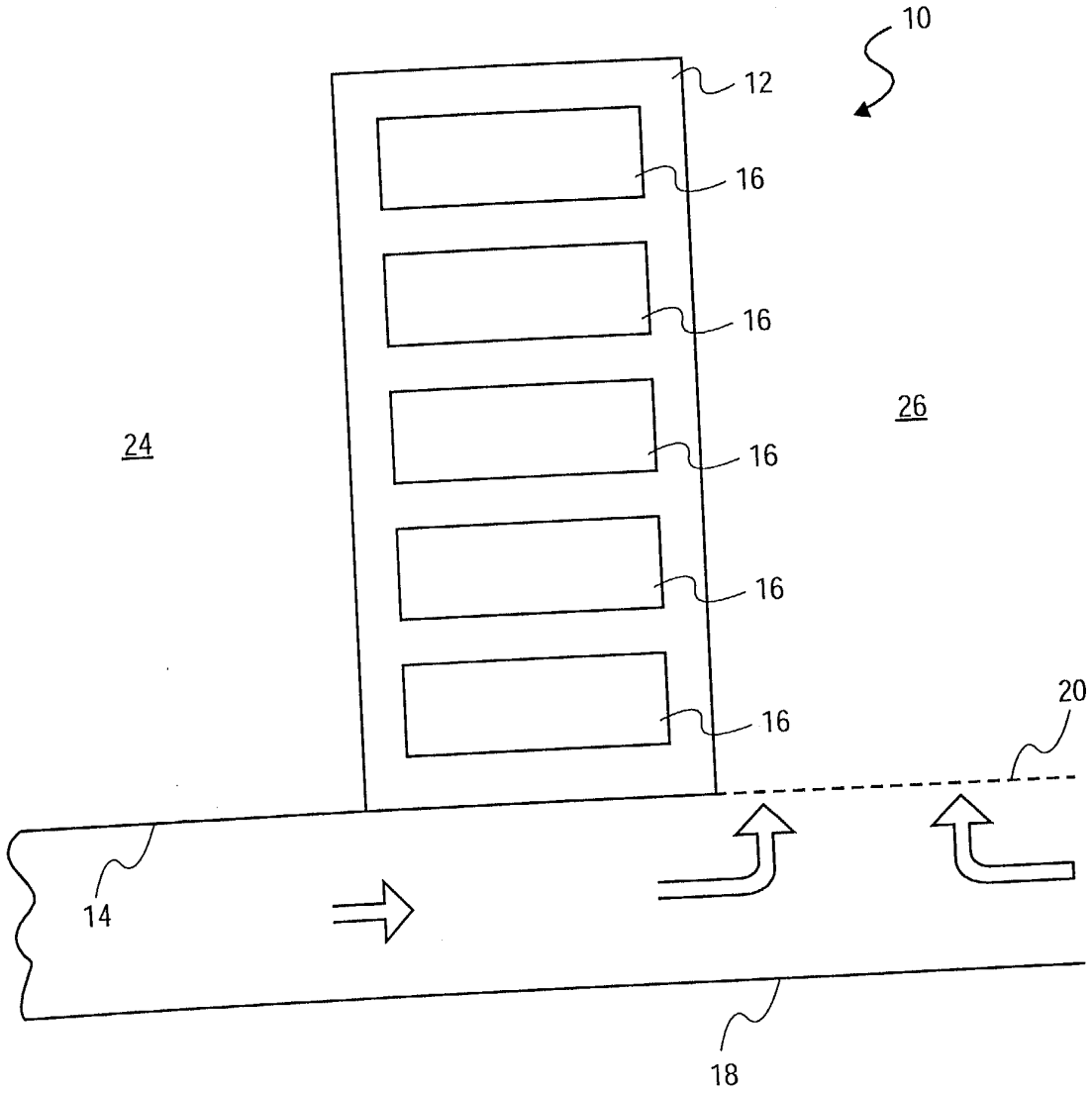

FIG. 1B

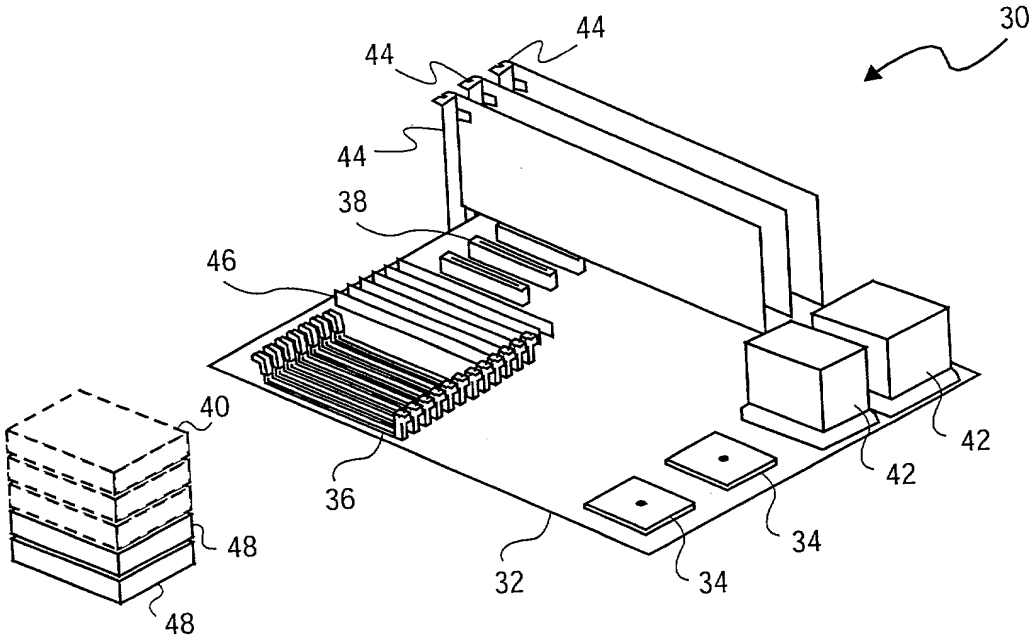

FIG. 2A

COMPONENT	ACTUAL CONFIG.	MAX CONFIG.	DE-RATING FACTOR	VR EFFICIENCY	POWER RANGE LOWER-UPPER (WATTS)	POWER CONSUMED (WATTS)
PROCESSORS (CPU)	2	4	0.8	0.85	30-60	$\frac{(4X60X0.8)}{0.85} = 225.9$
MEMORY	6	12	0.7	0.85	5-20	$\frac{(12X20X0.7)}{0.85} = 197.6$
I/O ADAPTERS	3	8	0.5	1.0	5-20	$\frac{(8X20X0.5)}{1.0} = 80$
DISK DRIVES	2	5	0.8	1.0	10-20	$\frac{(5X20X0.8)}{1.0} = 50$
					$P_{MAX} \rightarrow$	553.5W

FIG. 2B

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal
1	q_1	p_1	D_1	E_1	$q_1(\frac{p_1 D_1}{E_1})$
⋮	⋮	⋮	⋮	⋮	⋮
j	q_j	p_j	D_j	E_j	$q_j(\frac{p_j D_j}{E_j})$
⋮	⋮	⋮	⋮	⋮	⋮
J	q_J	p_J	D_J	E_J	$q_J(\frac{p_J D_J}{E_J})$
				P_{CONFIG} →	$\sum_{j=1}^{J} q_j(\frac{p_j D_j}{E_j})$

Figure 3A

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal (Watts)
Processors	2	40	0.8	0.85	75.3
Memory	6	10	0.7	0.85	49.4
I/O	3	10	0.5	1.0	15
Disk	2	15	0.8	1.0	24
				P_{CONFIG} →	163.7W

Figure 3B

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal (Watts)
1	q_1	p_1	D_1	E_1	$q_1(\frac{p_1 D_1}{E_1})$
⋮	⋮	⋮	⋮	⋮	⋮
j	q_j	p_j	D_j	E_j	$q_j(\frac{p_j D_j}{E_j})$
j+1	q_{j+1}	$P_{(MAX)\,j+1}$	D_{j+1}	E_{j+1}	$q_{j+1}(\frac{p_{(MAX)\,j+1} D_{j+1}}{E_{j+1}})$
⋮	⋮	⋮	⋮	⋮	⋮
J	q_J	$P_{(MAX)\,J}$	D_J	E_J	$q_J(\frac{p_{(MAX)\,J} D_J}{E_J})$
				P_{CONFIG} →	$\sum_{j=1}^{j} q_j(\frac{p_j D_j}{E_j}) + \sum_{j=j+1}^{J} q_j(\frac{p_{(MAX)\,j} D_j}{E_j})$

Figure 4A

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal (Watts)
CPU	2	40	0.8	0.85	75.3
Memory	6	20	0.7	0.85	98.8
I/O	3	20	0.5	1.0	30
Disk	2	20	0.8	1.0	32
				P_{CONFIG} →	236.1W

Figure 4B

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal (Watts)
1	q_1	p_1	D_1	E_1	$q_1(\frac{p_1 D_1}{E_1})$
⋮	⋮	⋮	⋮	⋮	⋮
j	q_j	p_j	D_j	E_j	$q_j(\frac{p_j D_j}{E_j})$
⋮	⋮	⋮	⋮	⋮	⋮
J	q_J	p_J	D_J	E_J	$q_J(\frac{p_J D_J}{E_J})$
				P_{CONFIG} →	$\beta\left[\sum_{j=1}^{J} q_j(\frac{p_j D_j}{E_j})\right]$

Figure 5A

Component	Quantity	Power (Watts)	De-rating Factor	VR Efficiency	Subtotal (Watts)
CPU	2	40	0.8	0.85	75.3
Memory	6	10	0.7	0.85	49.4
I/O	3	10	0.5	1.0	15
Disk	2	15	0.8	1.0	24
Note: β= 1.1				P_{CONFIG} →	180.1W

Figure 5B

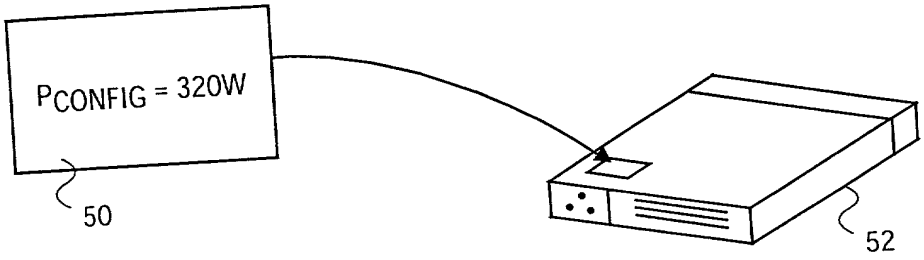
PCONFIG = 320W
50
52

FIG. 6A

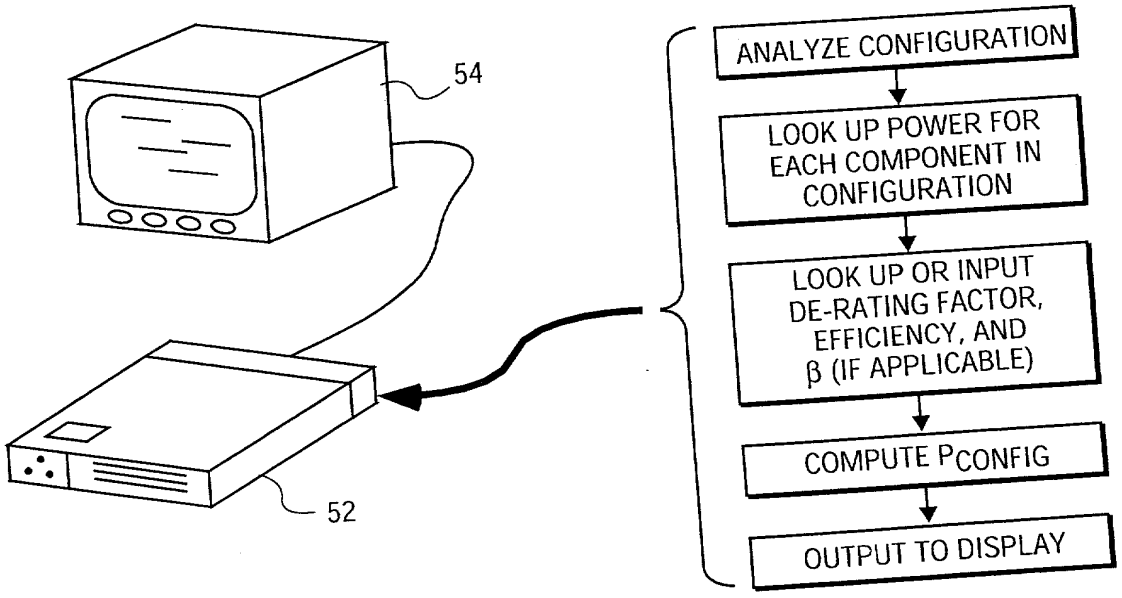
54
52
ANALYZE CONFIGURATION
LOOK UP POWER FOR EACH COMPONENT IN CONFIGURATION
LOOK UP OR INPUT DE-RATING FACTOR, EFFICIENCY, AND β (IF APPLICABLE)
COMPUTE PCONFIG
OUTPUT TO DISPLAY

FIG. 6B

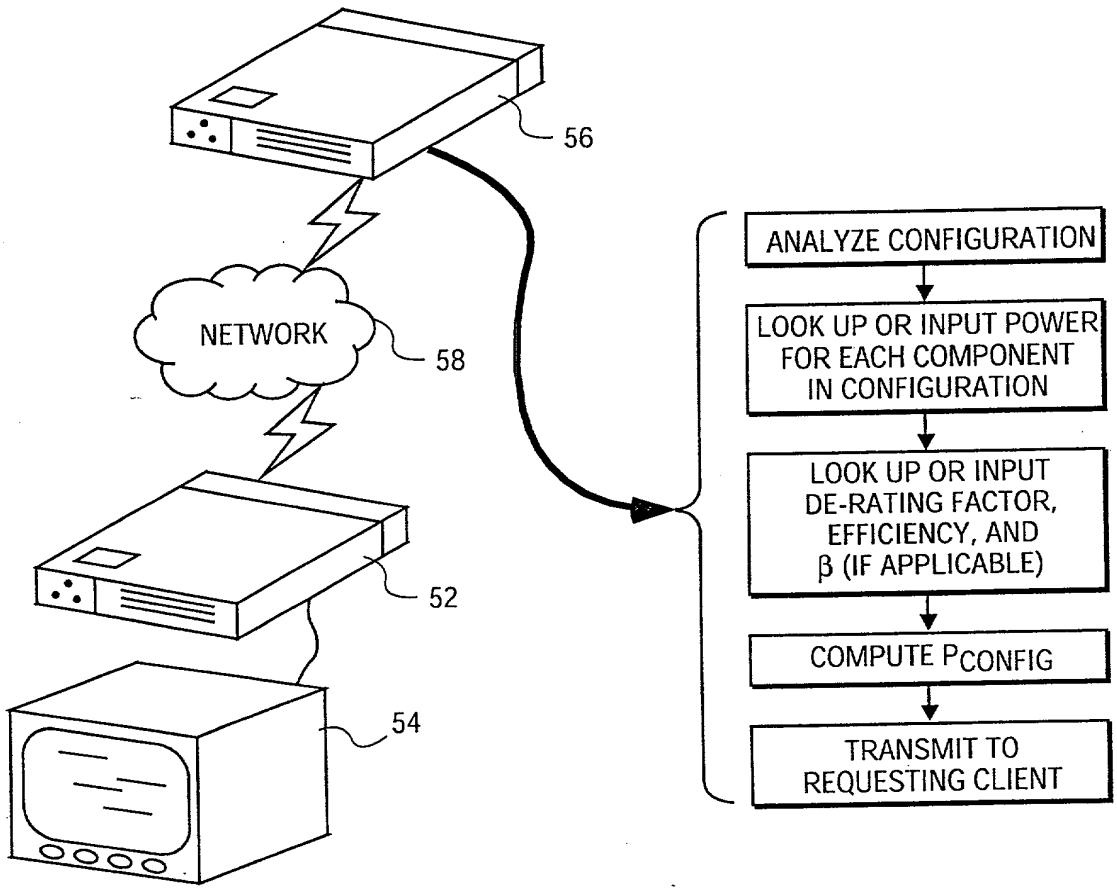
56
NETWORK
58
52
54
ANALYZE CONFIGURATION
LOOK UP OR INPUT POWER FOR EACH COMPONENT IN CONFIGURATION
LOOK UP OR INPUT DE-RATING FACTOR, EFFICIENCY, AND β (IF APPLICABLE)
COMPUTE PCONFIG
TRANSMIT TO REQUESTING CLIENT

FIG. 6C